REMARKS

Reconsideration of the present application is respectfully requested. Claims 1-42 were originally presented. Claims 12, 21, 24, and 32 have been amended, claims 20 and 31 have been canceled, and claims 43-45 have been added so that claims 1-19, 21-30, and 32-45 are currently pending. Claims 1, 12, 24, and 35 are in independent form.

Applicants wish to thank the Examiner for the in-person interview courteously granted by the Examiner on November 29, 2006. In the interview, the rejections under 35 U.S.C. §112 for new matter and enablement were discussed. In addition, possible amendments to independent claims 12 and 24 were discussed, and the patentability of independent claim 35 was argued. As indicated in the interview, Applicants will now address the issues and expand upon the arguments presented in the interview.

In the Office Action of September 14, 2006, the Examiner indicates that claims 1-11 are allowable over the cited prior art of record.

In the Office Action, the Examiner rejects claims 12-18, 24-29, and 35-39 under 35 U.S.C. §112, first paragraph, for failing to comply with the written description requirement, stating that these claims contain "new matter and specific support in the instant specification needs to be pointed out for each limitation." P. 2, ll. 8-10. Applicants submit that these claims do not constitute new matter and, as evidence, provide Table 1 on the following page, which provides an example of at least one location in the specification that provides support for each of claims 12-18, 24-29, and 35-39.

Table 1: Examples of Support for Claims 12-18, 24-29, and 35-29.

Claim	Support Location in Specification
12	p. 3, ll. 12 and 13 and p. 8, l. 6 to p. 9, l. 17; claims 1, 2, 3, 6
13	p. 8, ll. 16-18
14	p. 8, ll. 16-20
15	p. 8, l. 30 - p. 9, l. 2
16	p. 8, l. 30 - p. 9, l. 2
17	p. 8, ll. 20-22; claim 11
18	p. 8, ll. 6-8 and 16-29
24	p. 3, ll. 12 and 13; p. 8, l. 6 to p. 9, l. 17; and p. 9, l. 18 and 19; claim 1
25	p. 8, l. 30 - p. 9, l. 2 and p. 9, ll. 18-22
26	p. 9, ll. 22-24
27	p. 8, l. 30 - p. 9, l. 2 and p. 9, ll. 18-22
28	p. 9, ll. 22-24
29	p. 8, ll. 20-22; claim 11
35	p. 3, ll. 12 and 13; p. 8, l. 6 to p. 9, l. 17; and p. 8, l. 30 - p. 9, l. 1; claims 1, 2
36	p. 3, ll. 12 and 23
37	p. 8, l. 30 - p. 9, l. 2
38	p. 3, ll. 12 and 23
39	p. 8, ll. 20-22; claim 11

In light of the foregoing, Applicants request the written description rejection of claims 12-18, 24-29, and 35-39 under §112, first paragraph, be reconsidered and withdrawn.

In the Office Action, the Examiner rejects claims 12-34 under 35 U.S.C. §112, first paragraph for failing to comply with the enablement requirement, stating that the specification "does not reasonably provide enablement for the use of a catalyst composition only comprising gallium." P. 2, ll. 12-15. Similarly, the Examiner rejects claims 35-42 because the specification "does not reasonably provide enablement for the use of a catalyst composition only comprising a solid acid." Office Action, p. 3, ll. 4 and 5. In support of these rejections, the Examiner states that "[t]he instant specification requires the catalyst composition to comprise copper, zinc, aluminum, gallium, and a solid acid in order to convert CO_2 into oxygenates." Office Action, p. 2, ll. 19 and 20; p. 3, ll. 8 and 9. Applicants submit that, for the reasons discussed in detail below, the Examiner has failed to establish that claims 12-42 are not enabled by the specification.

Applicants emphasize that the claims use the term "comprising," yet the Examiner seems to interpret the claims as if they recite the phrase "consisting of." According to the MPEP, the "transitional term 'comprising,' which is synonymous with 'including,' . . . is inclusive or open-ended and does not exclude additional, unrecited elements or method steps." MPEP §2111.03. Moreover, use of the term "comprising" leaves "the claim open for the inclusion of unspecified ingredients even in major amounts." *Ex parte Davis*, 80 U.S.P.Q. 448, 450 (Bd. App. 1948). Thus, contrary to the Examiner's assertions, when properly interpreted, claims 12-34, are in fact, *not* limited to a catalyst composition comprising *only* gallium and a solid acid (as amended), and claims 35-42 are in fact, *not* limited to a catalyst composition comprising *only* a solid acid. Rather, claims 12-42, through use of the term "comprising," recite a catalyst composition which can contain elements other than those specifically recited in the claims, such as, for example, copper, zinc, and/or aluminum in accordance with the one embodiment disclosed in the specification, and are not necessarily limited *only* to the specifically enumerated materials.

In addition, Applicants note that during patent examination, the pending claims must be "given [their] broadest reasonable interpretation consistent with the specification." MPEP §2111 (citing *In re Hyatt*, 211 F.3d 1367, 1372, 54 U.S.P.Q.2d 1664, 1667 (Fed. Cir. 2000)). Further, even if the specification discloses only a single embodiment, this does not mean that the claims must be construed as being limited to that embodiment. *See Liebel-Flarsheim Co. v. Medrad Inc.*, 358 F.3d 898, 906, 69 U.S.P.Q.2d 1801, 1807 (Fed. Cir. 2004). The present application discloses a novel process of converting carbon dioxide-containing feed into oxygenates. The application also discloses that one catalyst composition suitable for use in this process comprises copper, zinc, aluminum, gallium, and a solid acid. "Limiting an applicant to the preferred materials in the absence of limiting prior art would not serve the constitutional purpose of promoting the progress in the useful arts." MPEP §2164.08(c). Therefore, just because the specification discloses one embodiment of a catalyst suitable for use in this process, does not mean that the claims should be limited to that embodiment alone.

Moreover, "[t]he test of enablement is whether one reasonably skilled in the art could make or use the invention from the disclosures in the patent coupled with information known in the art without undue experimentation." MPEP §2164.01 (quoting *United States v. Telectronics,* *Inc.*, 857 F.2d 778, 785, 8 U.S.P.Q.2d 1217, 1223 (Fed. Cir. 1988)). Applicants submit that the Examiner has not demonstrated that practicing claims 12-42 would require undue experimentation by persons of ordinary skill in the art. In view of the detailed specification and example, and the level of skill in the art, the claims should not be limited to the preferred embodiments disclosed in the specification because a person of ordinary skill in the art would clearly understand the scope and content of claims 12-42, and would not understand them as reciting catalyst compositions comprising *only* the recited elements. Moreover, Applicants maintain that the present specification enables a person of ordinary skill in the art to practice the claimed invention without undue experimentation. Thus, Applicants submit that the specification is enabling for a composition *comprising* gallium and a solid acid or a composition *comprising* a solid acid. Accordingly, Applicants request that the lack of enablement rejection of claims 12-42 under 35 U.S.C. §112, first paragraph, be withdrawn.

In the Office Action, the Examiner rejects claims 12-19 and 24-30 under 35 U.S.C. §103(a) as being unpatentable over Japan 2001-070793 (hereinafter JP `793). Independent claims 12 and 24 have been amended to additionally recite "a solid acid." Support for these amendments can be found, for example, on page 3, line 6 and 13; page 4, lines 21-33; and page 5, lines 1-10 of the specification. JP `793 does not teach or suggest the use of a composition comprising a solid acid. Thus, Applicants request the withdrawal of the rejection of claims 12-19 and 24-30 under 35 U.S.C. §103(a) based on JP `793.

In the Office Action, the Examiner rejects claims 35, 37, 39, and 41 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,279,830 to Haag et al. (hereinafter Haag). In support of these rejections, the Examiner states that Haag discloses "the instantly claimed process of converting CO2 into oxygenates by contacting with a catalyst comprising a solid acid, eg. ZSM5." Office Action, p. 5, ll. 3-5. However, for the reasons detailed below, Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness based on Haag.

To establish a *prima facie* case of obviousness based on a single prior art reference, the reference must teach or suggest all of the claim limitations. MPEP §2143. Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness because, for example, the prior art reference relied on by the Examiner fails to teach or suggest every limitation of independent claim 35. For example, Haag does not disclose a "carbon dioxide-containing feed comprising at least 90 volume percent carbon dioxide and hydrogen" as recited by independent claim 35, discussed in detail below.

Haag teaches a process employing dual series reactors for the conversion of a feed stream including carbon monoxide (CO) and hydrogen into hydrocarbon. *See* col. 2, ll. 54-68. In the first reactor, the syngas is converted via a Fischer-Tropsch process into oxygenates, which can be removed prior to processing the remainder of the product in the second reactor with HZSM-5 zeolite to yield the converted hydrocarbon. *See* col. 1, l. 62 - col. 2, l. 5. Haag teaches that the syngas "hydrogen-to-carbon oxides volume ratio" is in the range of from 0.5 to 1.0, or 0.6 to 0.8 and teaches that including CO_2 in the feed gas results in lower conversion. *See* col. 3, ll. 56-59, col. 10, ll. 55 and 56. In Examples 2-4, Haag employs a "mixture of hydrogen, carbon monoxide and carbon dioxide in a [volume] ratio of 4.6 to 1 to 1.6 ... as the feed" to a first Fischer-Tropsch reactor. *See* col. 25, ll. 14-16. In Examples 19 and 20, "[t]he [volume] ratio [in the] feed of H_2:CO:CO_2 was 5.8:1.0:1.3." *See* col. 18, l. 29.

In order to compare the above volume ratios, which represent the maximum disclosed amount of CO_2 in the syngas feed according to Haag, to the "at least 90 volume percent carbon dioxide and hydrogen" of limitation of independent claim 35, the volume ratios need to be converted into volume percentages. To convert the ratios to percentages, the numbers corresponding to the individual components in the ratio were summed to determine a total for each ratio. For example, to convert the ratio in Examples 2-4, the number corresponding to the relative amounts of hydrogen (4.6), carbon monoxide (1), and carbon dioxide (1.6) were added to determine a total ($\Sigma = 7.2$). To determine the volume percentages for an individual component, the original ratio number corresponding to the individual component was then divided by the r total and multiplied by 100 to be expressed as a percentage. For example, the volume percentage of hydrogen in Examples 2-4 is 4.6/7.2 x 100 or 63.9 volume percent. To determine the combined amount of hydrogen and carbon dioxide in the feed stream disclosed in each Example, the respective volume percentages for hydrogen and carbon dioxide were added (e.g., in Examples 2-4, 63.9% + 22.2% = 86.1% H_2 + CO_2). Table 2 below summarizes the volume percentages for each element and the combined amount of H_2 and CO_2 for the syngas feed streams disclosed in Examples 2-4, 19, and 20, each calculated as described above.

Table 2: Volume Percentages for Syngas Feed Streams in Examples 2-4, 19, and 20 of Haag

Examples in Haag	vol ratio				vol %			
	H_2	CO	CO_2	Σ	H_2	CO	CO_2	$H_2 + CO_2$
2 through 4	4.6	1	1.6	7.2	63.9%	13.9%	22.2%	**86.1%**
19 and 20	5.8	1	1.3	8.1	71.6%	12.3%	16.0%	**87.7%**

As illustrated in Table 1, the volume percentages disclosed by Haag for the amount of hydrogen and carbon dioxide in the syngas feed stream are 86.1 volume percent (in Examples 2-4) and 87.7 volume percent (in Examples 19 and 20). Thus, even the broadest disclosure of Haag does not disclose Applicants' claimed "carbon dioxide-containing feed comprising at least 90 volume percent carbon dioxide and hydrogen."

Further, Applicants submit that one would not be motivated to increase the amount of CO_2 in the syngas feed stream of Haag to obtain a $CO_2 + H_2$ content of more than 90 volume percent because, for example, Haag teaches that the use of syngas feeds having high CO_2 concentrations results in lower syngas-to-hydrocarbon conversion. For example, in column 10, lines 47-61, Haag discusses elements that lead to "high rates of conversion of a syngas feed." Primarily, Haag recommends employing a syngas feed with a "H_2/CO ratio in the range of 0.5 to about 1.0." In addition, Haag states, "100% syngas conversion can be achieved with *a CO_2-free gas.*" Col. 10, ll. 55 and 56, emphasis added. The examples section of Haag further support this statement by illustrating that syngas feeds employing carbon dioxide have a lower conversion than feeds employing a mixture of only carbon monoxide and hydrogen. For example, Example 13 and Example 19 of Haag were conducted under the same reactor conditions. *See* Table 5 and Table 7 in columns 17 and 18, respectively. Example 13 utilizes a syngas feed with *only* hydrogen and carbon monoxide, while Example 19 employs a syngas feed having 16 volume percent CO_2. Table 3 on the next page summarizes the results of the conversion of each element and the syngas feed according to the results reported in Tables 5 and 7 of Haag:

Table 3: Summary of Results of Haag Examples 13 and 19

Example Number (Haag)	**13**		**19**		
Syngas Feed Components	H_2	CO	H_2	CO	CO_2
Volume Ratio in Feed	2	1	5.8	1	1.3
Volume Percent in Feed	66.7%	33.3%	71.6%	12.3%	16.0%
Conversion in Product	51.0%	93.2%	45.1%	90.3%	3.9%
Syngas Feed Overall Conversion	**79.1%**		**70.9%**		

As illustrated in Table 3, the CO_2-free syngas feed employed in Example 13 not only resulted in higher conversions of both hydrogen (51% versus 45%) and carbon monoxide (93% versus 90%), but also resulted in an overall higher syngas conversion (79% versus 71%). Therefore, Applicants submit that Haag teaches away from additional carbon dioxide in the feed stream because, for example, a higher CO_2 content results in lower product conversion. Thus, Applicants assert that one skilled in the art would not be motivated to increase the amount of carbon dioxide in the feed of Haag because, for example, Haag teaches away from high quantities of carbon dioxide in the syngas feed. Accordingly, Applicants request the withdrawal of the rejection of claims 35, 37, 39, and 41 under 35 U.S.C. § 103(a) based on Haag.

Applicants have added claims 43-45 to further define the present invention. Support for the newly added claims can be found in the specification, for example, page 8, lines 21 and 22; page 8, lines 25-29; and page 8, line 30 to page 9, line 2.

In light of the foregoing, Applicants submit that independent claims 12, 24, and 35 are patentable over the prior art references of record. Claims 13-19 and 21-23 depend from independent claim 12; claims 25-30 and 32-34 depend from independent claim 24; and claims 36-45 depend from independent claim 35. These dependent claims recite additional patentable features and should also be allowable as being based on allowable independent claims. As discussed previously, the remaining pending claims were indicated by the Examiner as being allowable.

Applicants submit that the present application should now be in condition for allowance and such allowance is respectfully requested. Should the Examiner have any questions, please contact the undersigned at (800) 445-3460. The Commissioner is hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 19-0522.

Please deduct the amount of $100.00 from Deposit Account 19-0522 for the 2 additional dependent claims. The Commissioner is also hereby authorized to charge any additional fees associated with this communication or credit any overpayment to Deposit Account No. 19-0522.

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